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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jingjiao Guan

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EXAMINER

GODFREY, KEITH JOSEPH

ART UNIT

PAPER NUMBER

1732

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/700,715	Applicant(s) GUAN ET AL.	
	Examiner Keith J. Godfrey	Art Unit 1732	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-7 is/are allowed.
- 6) ☐ Claim(s) 8-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>07/12/2004, 02/19/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 8-9, 11, 13-15, 17, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Brewer (US 6946322) in view of Suleski (US 6027595) and in further view of Makino et al. (US 2003/0165778 A1).

**As to claim 8**, Brewer (US 6946322) teaches a method including: providing a shaping wafer (polymer stamp) with geometric shapes involving depressions (microwells) and protrusions (micropillars) (Fig. 3C, element 180 and col. 8, lines 46-50); providing a substrate (130) including an etch stop layer (layer of dissolvable material) (120) (Fig. 3A, elements 130 and 120), pressing into a polymer multilayer supported on the substrate, thereby thoroughly covering all depressions (microwells) with polymer 170 (Fig. 3C and 3D, element 170 and col. 8, lines 53-59); and removal of shaping wafer (polymer stamp) (Fig. 3E). It is further taught that the substrate and removable layer are selectively etched to release the microparticles (column 6, lines 35-45).

**As to claim 14**, Brewer (US 6946322) teaches a method including: providing a shaping wafer (polymer stamp) with geometric shapes involving depressions

(microwells) and protrusions (micropillars) (Fig. 3C, element 180 and col. 8, lines 46-50); providing a substrate (130) including an etch stop layer (layer of dissolvable material) (120) (Fig. 3A, elements 130 and 120), pressing into a polymer multilayer supported on the substrate, thereby thoroughly covering all depressions (microwells) with polymer 170 and protrusions with an epitaxial layer 131 (second polymeric solution) (Fig. 3C and 3D, elements 131 and 170 and col. 8, lines 53-59); and removal of shaping wafer (polymer stamp) (Fig. 3E). It is further taught that the substrate and removable layer are selectively etched to release the microparticles (column 6, lines 35-45).

Brewer (US 6946322) does not teach coating of the polymer stamp, curing the polymer thereon, and transferring the polymer layers onto another substrate.

Suleski (US 6027595) teaches a method including: contacting a stamp with a plurality of depressions (microwells) and protrusions (micropillars) with partially cured liquid photoresist (polymer) (col.2, lines 7-18; 30-31 and Fig. 1, element 10); curing of the photoresist (polymer) (col. 5, lines 65-67); and transferring the photoresist pattern to a substrate (col. 6, lines 5-8).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Brewer (US 6946322) to include applying and curing the polymer multilayer to the stamp before transferring to a substrate, as taught by Suleski (US 6027595), because Suleski (US 6027595) explicitly teaches an improved upon method of applying a photoresist layer to a substrate over the same method used in Brewer (US 6946322) so as to reduce shifting on and peeling from the substrate (Suleski (US 6027595) col. 1, lines 20-28). Because both of the

references are concerned with a similar technical field, namely that of photolithography, one would have a reasonable expectation of success from the combination.

Brewer (US 6946322) further does not teach a polymethacrylic acid as the hydrogel.

Makino et al. (US 2003/0165778 A1) teaches a hydrophilic polymer used in a lithographic process as a support layer including polymethacrylic acid (hydrogel) (paragraph [0166]). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polymer polymethacrylic acid as the hydrogel precursor, as taught by Makino et al. (US 2003/0165778 A1), in the method of Brewer (US 6946322) in view of Suleski (US 6027595) because hydrogel polymers such as polymethacrylic acid have an elastic quality and can receive dampening water for printing which makes them highly compatible for printing/lithographic processes. Because both of the references are concerned with a similar technical field, namely that of lithographic processes, one would have a reasonable expectation of success from the combination.

**As to claims 9 and 15,** Brewer (US 6946322) does not teach a polydimethyl siloxane stamp.

Suleski (US 6027595) teaches a polydimethyl siloxane stamp (col. 2, lines 24-27). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a polydimethyl siloxane stamp, as taught by Suleski (US 6027595), as the shaping wafer (polymer stamp) taught in Brewer (US 6946322),

because polydimethyl siloxane also displays elastic qualities making it optimal for making numerous and efficient stamps.

**As to claims 11 and 17**, Brewer (US 6946322) teaches a glass substrate (col. 5, lines 52-57).

**As to claims 13 and 19**, Brewer (US 6946322) teaches using a solvent such as water and ethanol (buffer solution) to etch the etch stop layer (dissolvable layer) (col. 2, lines 18-27).

Brewer (US 6946322) does not teach coating of the polymer stamp, curing the polymer thereon, and transferring the polymer layer onto another substrate.

Suleski (US 6027595) teaches a method including: contacting a stamp with a plurality of depressions (microwells) and protrusions (micropillars) with partially cured liquid photoresist (polymer) (col.2, lines 7-18; 30-31 and Fig. 1, element 10); curing of the photoresist (polymer) (col. 5, lines 65-67); and transferring the photoresist pattern to a substrate (col. 6, lines 5-8).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Brewer (US 6946322) to include applying and curing the polymer layer to the stamp before transferring to a substrate, as taught by Suleski (US 6027595), because Suleski (US 6027595) explicitly teaches an improved upon method of applying a photoresist layer to a substrate over the same method used in Brewer (US 6946322) so as to reduce shifting on and peeling from the substrate (Suleski (US 6027595) col. 1, lines 20-28). Because both of the references

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are concerned with a similar technical field, namely that of photolithography, one would have a reasonable expectation of success from the combination.

Brewer (US 6946322) further does not teach a polymethacrylic acid as the hydrogel.

Makino et al. (US 2003/0165778 A1) teaches a hydrophilic polymer used in a lithographic process as a support layer including polymethacrylic acid (hydrogel) (paragraph [0166]). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polymer polymethacrylic acid as the hydrogel precursor, as taught by Makino et al. (US 2003/0165778 A1), in the method of Brewer (US 6946322) in view of Suleski (US 6027595) because hydrogel polymers such as polymethacrylic acid have an elastic quality and can receive dampening water for printing which makes them highly compatible for printing/lithographic processes. Because both of the references are concerned with a similar technical field, namely that of lithographic processes, one would have a reasonable expectation of success from the combination.

**Claims 10 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Brewer (US 6946322) in view of Suleski (US 6027595) in further view of Makino et al. (US 2003/0165778 A1) as applied to claims 8-9, 11, 13-15, 17, and 19 above, and further in view of Bures et al. (US 2002/0071869 A1).

The teachings of Brewer (US 6946322) in view of Suleski (US 6027595) in further view of Makino et al. (US 2003/0165778 A1) are discussed in the rejections of claims 8-9, 11, 13-15, 17, and 19 above.

**As to claims 10 and 16**, previously discussed above in the rejections of claims 8 and 14 above, Makino et al. (US 2003/0165778 A1) teaches the use of polymethacrylic acid (hydrogel). As to the second polymer, Brewer (US 6946322) does not teach the use of polylactic-co-glycolic acid.

Bures et al. (US 2002/0071869 A1) teaches a biodegradable microsphere made from the copolymers of poly(lactic acid) and poly(glycolic acid) (paragraph [0006]). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the copolymers of poly(lactic acid) and poly(glycolic acid), as taught by Bures et al. (US 2002/0071869 A1), as the epitaxial layer in the method of Brewer (US 6946322) in view of Suleski (US 6027595) in further view of Makino et al. (US 2003/0165778 A1) because copolymers of poly(lactic acid) and poly(glycolic acid) have the ability to hydrolyze into soluble products found naturally in the body. Because both of the references are concerned with a similar technical field, namely that of hydrophilic coatings, one would have a reasonable expectation of success from the combination.

**Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Brewer (US 6946322) in view of Suleski (US 6027595) in further view of Makino et al. (US



2003/0165778 A1) as applied to claims 8-9, 11, 13-15, 17, and 19 above, and in further view of Murthy et al. (US 6158843).

The teachings of over Brewer (US 6946322) in view of Suleski (US 6027595) in further view of Makino et al. (US 2003/0165778 A1) are discussed above in the rejections of claims 8-9, 11, 13-15, 17, and 19 above.

**As to claims 12 and 18**, Brewer (US 6946322) in view of Suleski (US 6027595) in further view of Makino et al. (US 2003/0165778 A1) do not teach using polyvinyl alcohol as the material for the dissolvable layer.

Murthy et al. (US 6158843) teaches the use of polyvinyl alcohol as a sacrificial layer coated onto an adhesive layer (substrate) removed (dissolved) by water (col. 4, lines 19-24 and 29-32 and col. 8, lines 50-54). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polyvinyl alcohol sacrificial layer of Murthy et al. (US 6158843) as the wax or epoxy filler layer in the modified method of Brewer (US 6946322) in view of Suleski (US 6027595) in further view of Makino et al. (US 2003/0165778 A1) because polyvinyl alcohol has excellent film forming and adhesive properties and is nontoxic if ingested. Because both of the references are concerned with a similar technical field, namely that of sacrificial layer coatings, one would have a reasonable expectation of success from the combination.

***Allowable Subject Matter***

Claims 1-7 allowed.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach the instant step (d), in combination with the other features instantly claimed.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith J. Godfrey whose telephone number is 571-272-6391. The examiner can normally be reached on 8:00-5:00 Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina A. Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

kjg

  
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SUPERVISORY PATENT EXAMINER  
